AD-A270 122

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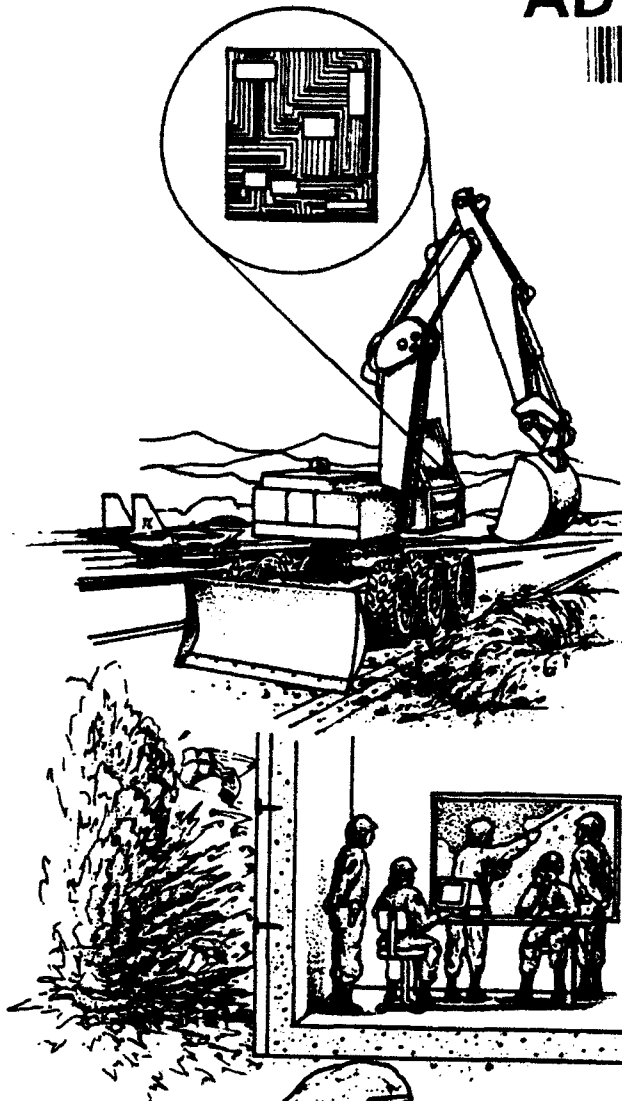# THE POST-DAM SYSTEM VOLUME V - HARVARD PROJEC MANAGER (HPM)

T.L. WARREN, J.J. HOWARD,
D.H. MERKLE

APPLIED RESEARCH ASSOCIATES, INC,
POST OFFICE BOX 40128
TYNDALL AFB FL 32403

OCTOBER 1992

FINAL REPORT

FEBRUARY 1989 - MARCH 1991

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Mission accomplishment in PACAF and USAFE depends on base recovery capability in a postattack environment. Base recovery includes identifying, analyzing, and repairing facility damage. For facilities critical to sortie generation, this process must be accomplished expediently.

In a postattack environment, field information on facility damage is collected and analyzed to determine structural integrity and usability. From this analysis, a repair schedule is developed. This is currently a time comsuming process that is shortened by using a computerized system.

The scope of this effort was to develop a computerized postattack damage assessment system that recommends repair strategies, keeps inventory of materials and equipment, and schedules repairs based on manpower and equipment availability.

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EXECUTIVE SUMMARY

A. OBJECTIVE

The objective of this report is to describe the software and hardware of the POST-DAM System, developed by Applied Research Associates, Inc., for airbase facility postattack damage assessment. This report contains descriptions of prototype software and hardware, and recommendations for full-scale development of both software and hardware.

B. BACKGROUND

In a postattack environment, field information on mission-critical facility damage is collected and analyzed to determine structural integrity and usability. From this analysis, a repair schedule is developed. This is a time-consuming process when done without the aid of a computerized system. Consequently, the POST-DAM System was developed to determine repair strategies with an expert system, keep track of materials and equipment with a relational database management system, and schedule repairs based on manpower and equipment availability with a project management system.

C. SCOPE

This technical report consists of nine volumes. Volume I describes software and hardware used with the prototype POST-DAM System, and recommends software and hardware for full-scale development. Volumes II through VIII are software user's manuals, which describe how to install and use the prototype software with the POST-DAM System. Volume IX is a field manual that contains diagrams of structures that are used with the POST-DAM system to locate damaged elements.

D. EVALUATION METHODOLOGY

The prototype POST-DAM System was developed using commercial, off-the-shelf (COTS) software and hardware. The system was constructed by integrating the software and hardware in such a way that a remote computer in the field can communicate with a host computer in the Base Civil Engineering (BCE) Damage Control Center (DCC). The POST-DAM system determines repair strategies, keeps track of materials and equipment, and schedules repairs based on manpower and equipment availability. This prototype system has been evaluated in-depth, and subsequent recommendations are made herein about software and hardware that should be used for full-scale development.

E. CONCLUSIONS

The prototype POST-DAM System is functional, but has limitations with respect to both hardware and software. The following problems were encountered:

1. The prototype remote computer is not portable, and cannot be used in the field. No satisfactory, hand-held remote terminal was available for this project.

2.   The expert system cannot hold all the information required for full-scale development, because it cannot use extended memory.

3.   Both the relational database management system and project management system require more human interaction than desired.

4.   The communication system software is not compatible with the Survivable Base Recovery After Attack Communication System (SBCS) being developed for ESD by Sumaria Systems, Inc., with which the POST-DAM System is required to interface.

F.   RECOMMENDATIONS

For full-scale development, the following features should be incorporated in the POST-DAM System.

1.   Replace the prototype remote computer with a hand-held terminal unit having at least 2 Mb of random access memory, and which can run applications requiring 640 Kb of base memory.

2.   Replace the prototype host computer with a system having at least 4 Mb of random access memory, IEEE 802.3 LAN ports, and able to support multi-tasking operations.

3.   Replace the CLIPS expert system shell with an expert system shell capable of supporting applications at least twice as large as those developed for the prototype system.

4.   Set the host computer up to interface with the IEEE 802.3 Ethernet local area network (LAN) used by SBCS.

5.   Construct a single computer program to replace the relational database management system and the project management system, to minimize the required amount of human intervention. This system should be developed by personnel with a strong background in computer science.

PREFACE

This report was prepared by Applied Research Associates, Inc. (ARA), P.O. Box 40128, Tyndall Air Force Base, FL 32403, under Contract F08635-88-C-0067, for the Air Force Civil Engineering Support Agency, Tyndall Air Force Base, Florida.

This report (Volumes I though IX) summarizes work completed between 1 February 1989 and 1 March 1991. Lt. James Underwood (USN) was the HQ AFCESA/RACS Project Officer.

This report has been reviewed by the Public Affairs Office, and is releasable to the National Technical Information Service (NTIS). At NTIS it will be available to the public, including foreign nations.

This technical report has been reviewed and is approved for publication.

Dan Shenbach, Maj., IAF
Project Officer

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Chief, Engineering Research Division

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Director, Civil Engineering Laboratory

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LIST OF FIGURES
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SECTION 1

INTRODUCTION

1.1 OBJECTIVE

The objective of this software user's manual (SUM) is to explain the procedures for using the Harvard Project Manager (HPM) project-management system with the POST-DAM Relational Data Base Management System (RDBMS), and TED 1.1 Text Editor to schedule repairs based on equipment and manpower availability. HPM is a complete project management package for planning and tracking projects of any complexity. However, only the project management tools and techniques used with POST-DAM are discussed in this SUM.

1.2 BACKGROUND

HPM allows the user to schedule expedient repairs to mission-critical facilities in a postattack environment. HPM is a commercial project management system distributed by Software Publishing Corporation. It is menu-driven, and designed for use on the IBM PC and compatible computers.

1.3 APPROACH

After a group of repairs is selected for a facility, the user activates HPM from POST-DAM RDBMS, using DESQview 386 as described in Section 3.4 of Document 2.2.3. The user then enters the facility number, required repairs, and required equipment and manpower for each repair. For each repair, the user selects the time at which the repair will start, and HPM then determines the repair duration based on manpower and equipment requirements. For each structure the repairs are scheduled consecutively to reduce repair team relocation time. However, repairs to different structures can be scheduled concurrently, provided there are no over-allocations. If over-allocations exist, HPM will alert the user, and repairs can be re-scheduled to eliminate the conflict. After repairs are scheduled for a facility, the user exits HPM using DESQview 386, and runs TED 1.1 to update the repair strategy file, as described in Document 2.2.6.

SECTION 2

APPLICABLE DOCUMENTS

2.1 SETA CONTRACT

2.1.1 <u>Postattack Damage Assessment of Facilities</u>, Subtask 2.02, Air Force Engineering and Services Center, SETA Contract F08635-88-C-0067, December 87.

2.1.2 <u>Postattack Damage Assessment of Facilities</u>, Subtask 2.02.1, Air Force Engineering and Services Center, SETA Contract F08635-88-C-0067, October 88.

2.1.3 <u>Postattack Damage Assessment of Facilities</u>, Subtask 2.02.2, Air Force Engineering and Services Center, SETA Contract F08635-88-C-0067, February 89.

2.2 POST-DAM SYSTEM USER'S MANUALS

2.2.1 The POST-DAM System, Volume 1, <u>Introduction to the POST-DAM System</u>, Applied Research Associates, Inc., Report to AFESC, March 91.

2.2.2 The POST-DAM System, Volume 2, <u>Software User's Manual for the Expert System</u>, Applied Research Associates, Inc., Report to AFESC, February 91.

2.2.3 The POST-DAM System, Volume 3, <u>Software User's Manual for DESQview 386</u>, Applied Research Associates, Inc., Report to AFESC, December 90.

2.2.4 The POST-DAM System, Volume 4, <u>Software User's Manual for the Relational Data Base Management System</u>, Applied Research Associates, Inc., Report to AFESC, December 90.

2.2.5 The POST-DAM System, Volume 6, <u>Software User's Manual for Crosstalk Mk.4 on the Host Computer</u>, Applied Research Associates, Inc., Report to AFESC, December 90.

2.2.6 The POST-DAM System, Volume 7, <u>Software User's Manual for the TCD 1.1 Editor</u>, Applied Research Associates, Inc., Report to AFESC, December 90.

2.2.7 The POST-DAM System, Volume 8, <u>Software User's Manual for Crosstalk Mk.4 on the Remote Computer</u>, Applied Research Associates, Inc., Report to AFESC, March 91.

2.2.8 The POST-DAM System, Volume 9, <u>Field Manual of Mission-Critical Facilities for Use with the Prototype POST-DAM System</u>, Applied Research Associates, Inc., Report to AFESC, March 91.

2.3 SOFTWARE USER'S MANUALS

2.3.8 <u>Harvard Project Manager 3.0 User's Manual</u>, Software Publishing Corporation, 1988.

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SECTION 3

INSTRUCTIONS FOR USE

3.1   INSTALLING HPM

3.1.1   System Configuration

      HPM is designed to run with PC-DOS 2.0 or higher on the IBM PC, or a
100 percent compatible microcomputer with 512 K random access memory (RAM), color
or monochrome monitor, hard disk, and 5.25-inch floppy disk drive. HPM is also
designed to interface with most commercial printers. Further information about
HPM system requirements is given in Document 2.3.8.

      To run HPM, the computer needs a DOS config.sys file, with a FILES command
accommodating at least 20 open files. Before installing HPM, be sure the
following command is in the config.sys file:

      FILES=N

where N is no smaller than 20.

3.1.2   Installing HPM Files

      HPM files are copied directly from the five HPM program disks into a single
subdirectory in the hard disk root directory. Starting from the hard disk root
directory, use the DOS MAKE DIRECTORY command to create the subdirectory HPM by
typing

      C:\>md\hpm [Enter]

where C is the hard disk root directory, highlighted characters are typed by the
user, and [Enter] means press the enter key after typing the command. Next,
using the DOS CHANGE DIRECTORY command, change to the subdirectory HPM by typing

      C:\>cd\hpm [Enter]

Next, copy the files from the five HPM program disks by inserting one program
disk at a time into floppy disk drive A:, and typing

      C:\hpm>copy a:*.* [Enter]

until all five disks have been copied into the HPM subdirectory.

3.2   STARTING THE HPM SYSTEM

      HPM is executed from the DESQview 386 utility. This process is described
in Section 3.4 of Document 2.2.3. After starting HPM, the title screen appears
as shown in Figure 3.1, then the main menu appears as shown in Figure 3.2.
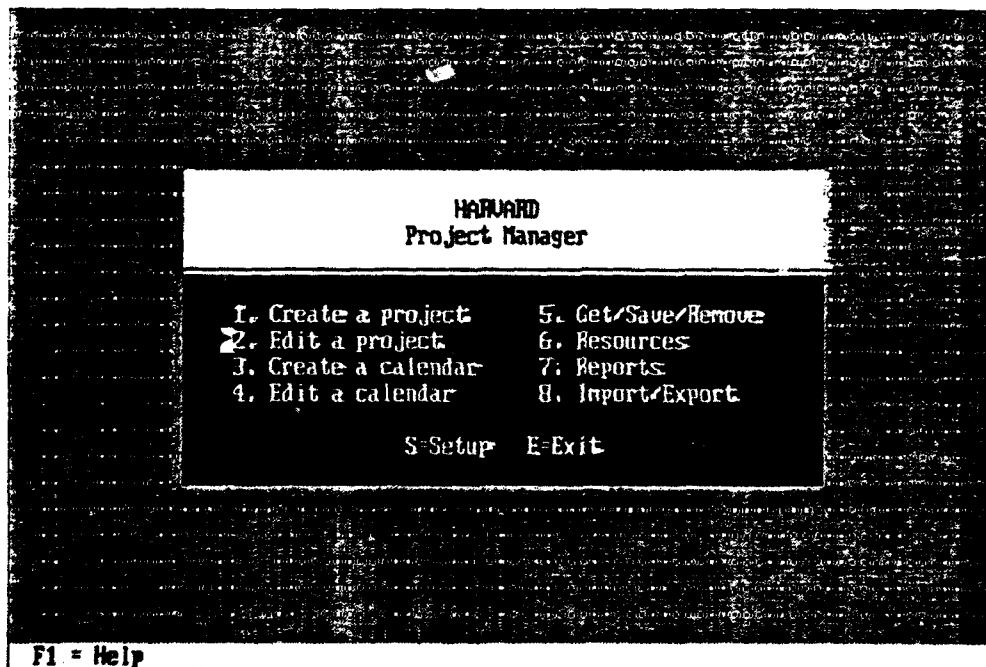
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Figure 3.1. HPM Title Screen.

Figure 3.2. Main Menu.

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3.3   USING HPM

This section of the SUM tells how to use HPM with POST-DAM RDBMS and TED 1.1 to schedule repairs to mission-critical facilities.

3.3.1   Starting a New Project

After entering the HPM Main Menu for the first time from RDBMS, using DESQview 386, the user must remove all old versions of the project "POSTDAM.PRJ," check that all resources are current, define a new project, and save the new project.

3.3.1.1   Removing Old Projects

To remove old projects, the user selects Option 5, "Get/Save/Remove," in the main menu. This is accomplished by either pressing the [5] key, or using the arrow keys to move the cursor to Option 5 and pressing [Enter]. The project list then appears on the screen, as shown in Figure 3.3, with the cursor pointing to the file POSTDAM.PRJ. To remove this file, the user presses the [F2] key, which displays the list of options shown in Figure 3.4. The user then selects Option 3 by pressing the [3] key, or using the arrow keys to move the cursor to Option 3 and pressing [Enter]. The user is then prompted to remove the project by pressing [F10], or to save the project by pressing [Esc], as shown in Figure 3.5. By pressing [F10], the file POSTDAM.PRJ is removed, and the user is returned to the project list. The user then exits the project list by pressing [Esc], and is returned to the main menu.

3.3.1.2   Resources

To check the available resource list, the user selects Option 6 "Resources" in the main menu. This is accomplished by either pressing the [6] key, or using the arrow keys to move the cursor to Option 6 and pressing [Enter]. The HPM resource list then appears on the screen, as shown in Figure 3.6, with the cursor pointing to "bulldozer". The user then manually compares the HPM resource list with the RDBMS resource list described in Section 3.3.1.6.5 of Document 2.2.4. The cursor is moved around the resource list by using the arrow keys to move it up and down, and the [Tab] and [Shift] [Tab] keys to move it to the right and left respectively. The resource list is edited by typing over the existing data, and [Esc] returns the user to the HPM main menu.

3.3.1.3   Creating a Project

To create a new project, the user selects Option 1, "Create a Project," in the main menu. This is accomplished by either pressing the [1] key, or using the arrow keys to move the cursor to Option 1 and pressing [Enter]. The fast track display then appears on the screen, as shown in Figure 3.7. At this point, the user must define the "EXPREPAIR" calendar and a time scale for the new POST-DAM project.

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Figure 3.3. Project List.

Figure 3.4. Files Menu.

Figure 3.5.   Remove Project.

Figure 3.6.   Resource List.

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Figure 3.7. Fast Track Display.

3.3.1.3.1 Exprepair Calendar

After entering the Fast Track Form, the user must change the project calendar from the standard calendar to the exprepair calendar. This is done by pressing the [F3] key, which displays the "Data" Menu, as shown in Figure 3.8. The user then selects Option 6 "Project Form" by either pressing the [6] key or using the arrow keys to move the small arrowhead to Option 6 and pressing [Enter]. The project form then appears on the screen, as shown in Figure 3.9, with the cursor in the Planned Start Section. The user then moves the cursor to the Calendar Section by using the arrow keys and the [Tab] key. At the Calendar Section, the user types "EXPREPAIR" over "STANDARD," as shown in Figure 3.10. The user saves the calendar, and returns to the Fast Track Form by pressing the [F10] key.

3.3.1.3.2 Timescale

To change the time scale, the user starts at the Fast Track Form and presses the [F5] key, which displays the "Format" Menu, as shown in Figure 3.11. The user selects Option 4 "Fast Track Display" by either pressing the [4] key, or using the arrow keys to move the small arrow head to Option 4 and pressing [Enter]. The Fast Track Display Form then appears on the screen, as shown in Figure 3.12, with the small arrowhead pointing to Dys. The user moves the arrowhead to Hrs by pressing the left arrow key, as shown in Figure 3.13. The user saves the new time scale, and returns to the Fast Track Form by pressing the [F10] key.

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Figure 3.8. Data Menu.

Figure 3.9. Project Form.

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Figure 3.10.   Project Form with EXPREPAIR Calendar.

Figure 3.11.   Format Menu.

Figure 3.12.   Fast Track Display Form.

Figure 3.13.   Fast Track Display Form Using Hours.

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3.3.1.4   Saving the Fast Track Project Form

To save the current Fast Track configuration, the user starts at the Fast Track Form and presses the [F7] key, which displays the "Other" Menu, as shown in Figure 3.14. The user selects Option 5 "Quick Save" by either pressing the [5] key, or using the arrow keys to move the small arrowhead to Option 5 and pressing [Enter]. The Save Project Window then appears on the screen, as shown in Figure 3.15, prompting the user for a project name. The user then types "POSTDAM," as shown in Figure 3.16. The user presses the [F10] key, which first saves the project in a file called POSTDAM.PRJ, then returns the user to the Fast Track Form.

3.3.1.5   Exiting Fast Track

To leave the Fast Track Form, the user presses the [Esc] key, and is returned to the HPM main menu.

3.3.2   Exiting HPM from the Main Menu

Before leaving the HPM system from the main menu, the user must save the latest version of the POSTDAM.PRJ file. To save the file, the user selects Option 5 "Get/Save/Remove" in the main menu. This is accomplished by either pressing the [5] key, or using the arrow keys to move the cursor to Option 5 and pressing [Enter]. The project list then appears on the screen, as shown in Figure 3.17, with the cursor pointing to the file POSTDAM.PRJ. To save this file, the user presses the [F2] key, which displays the list of options shown in Figure 3.18. Here, the user selects Option 2 by pressing the [2] key, or using the arrow keys to move the cursor to Option 2 and pressing [Enter]. The user is then prompted as shown in Figure 3.19, to either save the project POSTDAM by pressing the [F10] key, or cancel it by pressing the [Esc] key. Pressing the [F10] key saves the file POSTDAM.PRJ, and returns the user to the project list. The user exits the project list by pressing [Esc], and is returned to the main menu. The user pushes the [E] key, and is returned to the RDBMS program.

3.3.3   Editing a Project

After the POSTDAM.PRJ file has been created, the user can enter HPM and edit the file by using DESQview 386, as described in Section 3.4 of Document 2.2.3. To access the POSTDAM.PRJ file, the user selects Option 2 "Edit a Project" in the main menu. This is accomplished by either pressing the [2] key, or using the arrow keys to move the cursor to Option 2 and pressing [Enter]. The project list then appears on the screen, as shown in Figure 3.20, with POSTDAM.PRJ highlighted. Here, the user presses [Enter], and the Fast Track Form appears on the screen. From the Fast Track Form, the user can add, reschedule, and/or delete repairs.

3.3.3.1   Adding Repairs

Before entering HPM, the user must get a hard copy of the repair strategy file for the mission-critical facility to be repaired. That process is described in Section 3.3.1.7.1 of Document 2.2.4. An example repair strategy file is shown
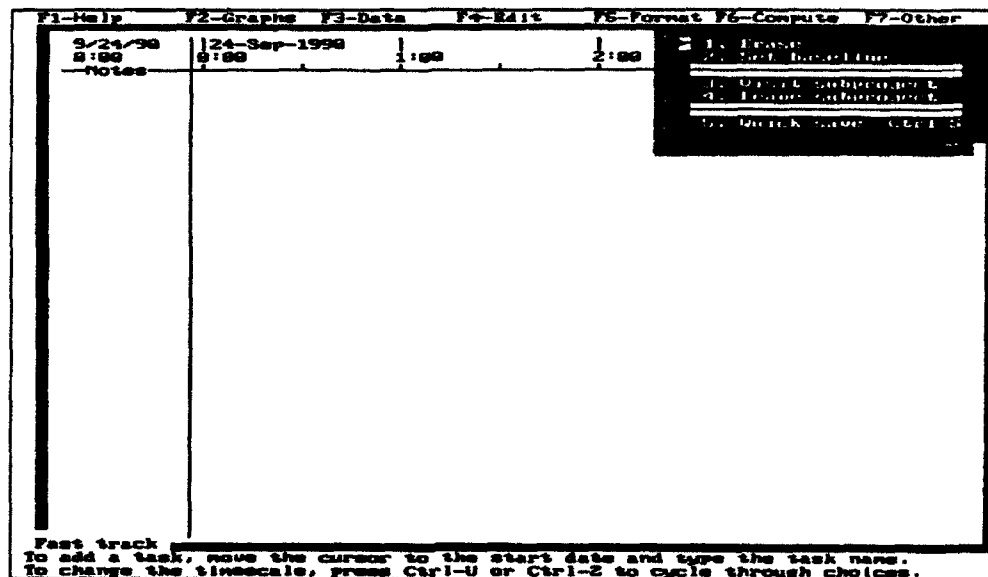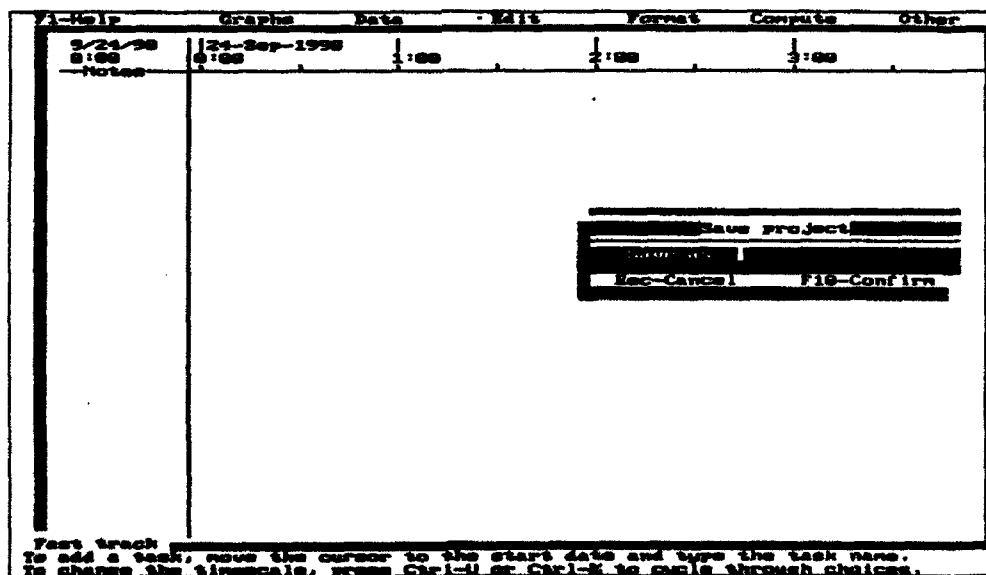
Figure 3.14.   Other Menu.
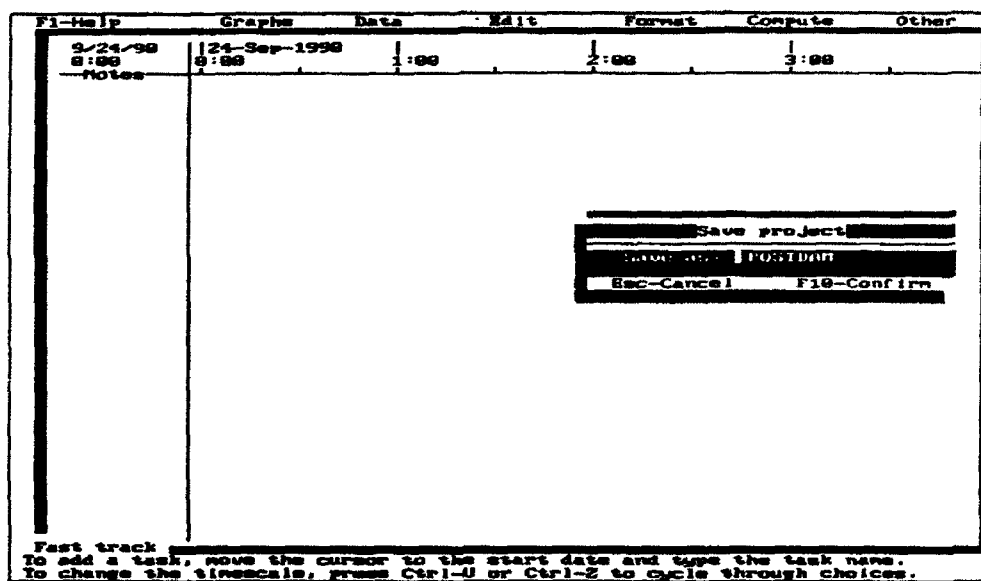

Figure 3.15.   Save Project Window.
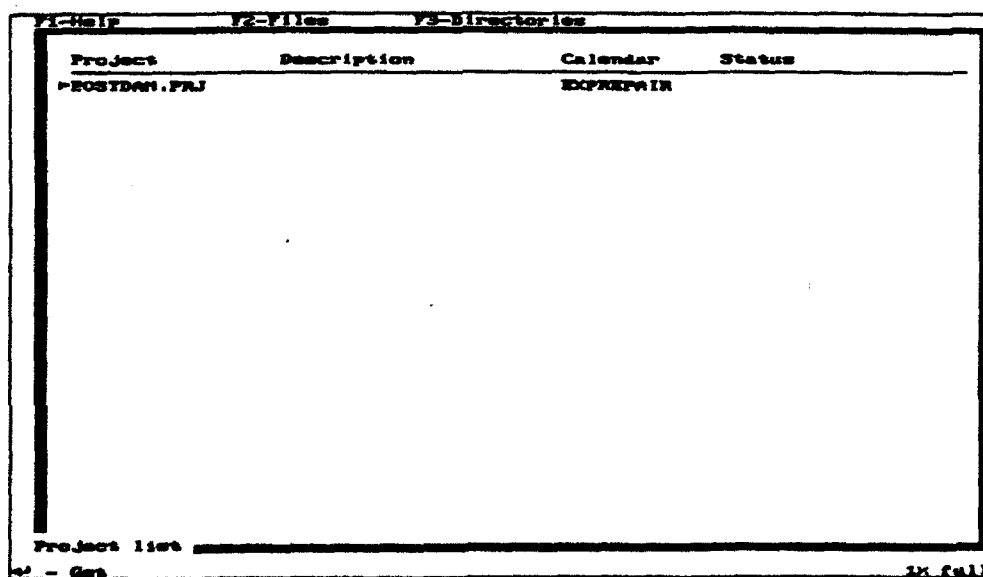
15

Figure 3.16. Save Project as POSTDAM Display.
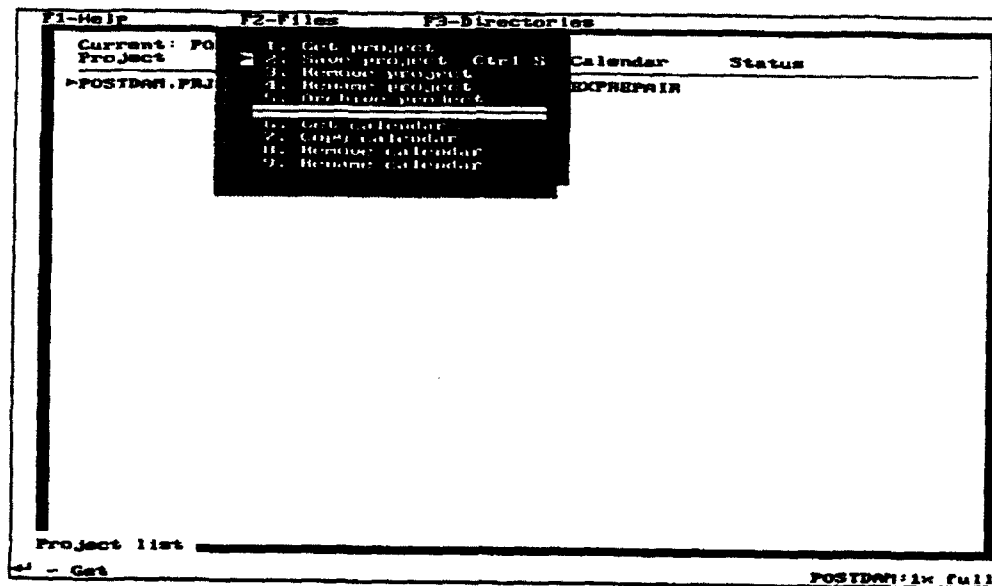

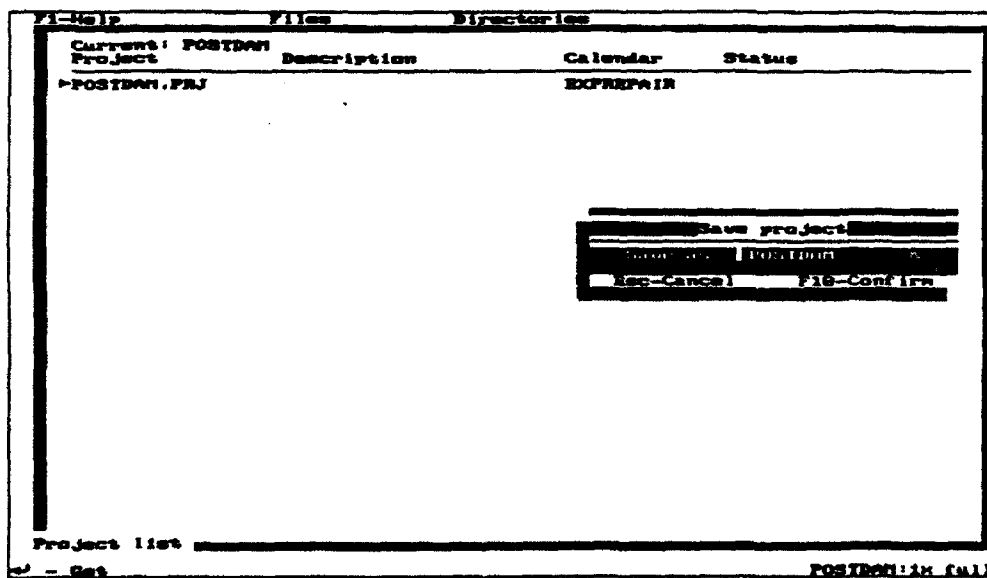
Figure 3.17. Project List.

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Figure 3.18. Files Menu.

Figure 3.19. Save Project.

Project	Description	Calendar	Status
►POSTDAM.PRJ	.	EXPREPAIR	

Project list

◄┘ - Get   1% full

Figure 3.20.   Edit a Project.

in Figure 3.21 for "Building 1," which requires a wall breach repair, and a column splint repair.

The repairs required by a mission-critical facility are entered into the POSTDAM.PRJ file from the Fast Track Form. The user begins by pressing the [F4] key, which displays the "Edit" menu shown in Figure 3.22. From the Edit Menu, the user selects Option 7 "Notes," which puts the cursor in the Notes Section of the Fast Track Form. Using the data in Figure 3.21 as an example, the user types the building number in the Notes Section, as shown in Figure 23.

From the Notes Section, the user then presses the [F4] key, which displays the "Edit" Menu, as shown in Figure 3.22. From the Edit Menu, the user selects Option 2 "Add Task," which displays the "Add Task" window shown in Figure 3.24. The first repair on the list is a wall breach, so at the "Task Name" prompt the user types in wb11, as shown in Figure 3.25. The letters wb stands for wall breach; the first 1 after wb means it is the first wall breach in Building 1 to be considered; the second 1 corresponds to the Building Number.   In the "Duration" section, "How many time units?" is set to 0.00, and "Which time units?" is set to Hrs. The user then presses the [F10] key, and repair wb11 appears on the Fast Track Form, as shown in Figure 3.26. To add the second task to the repair strategy file, the user returns to the Edit Menu and repeats the

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I.) GENERAL FACILITY INFORMATION

Function   : "Mission Control Center"
Priority   : 1
Description : "Three Story Reinforced Concrete Structure"

II.) DAMAGE ASSESSMENTS

Damage Assessment Number : 1

A.) General Element Information

Element Number   : 100
Element Description : EXTERIOR WALL
Damage Mode   : WALL BREACH
Damaged Width   : 12.0 ft.
Damaged Height   : 8.0 ft.
Repair Strategy   : SHOTCRETE

B.) Expedient Repair Information

1.) Repair Strategy :

SHOTCRETE

2.) Required Materials :

2x4   :   25.0 ft.
Plywood   :   93.3 sq. ft.
Wire Mesh :   32.0 sq. ft.
Shotcrete :   1.5 cubic yards
Water   :   60.0 gallons

3.) Required Equipment :

Shotcrete machine   : 1
Ramset   : 2
Repair Team   : 1

4.) Estimated Repair Time :

Repair Team Hours :   1.7

5.) Remarks   :

Broken gas lines in the area.

6.) Start Repair :

Finish Repair :

Damage Assessment Number : 2

A.) General Element Information

Element Number   : 600
Element Description : COLUMN
Damage Mode   : CRACKING/STEEL DEBONDING
Repair Strategy   : COLUMN SPLINT

B.) Expedient Repair Information

1.) Repair Strategy :

COLUMN SPLINT

2.) Required Materials :

Column Splint   : 1

3.) Required Equipment :

Repair Team   : 1

4.) Estimated Repair Time :

Repair Team Hours :   0.50

5.) Remarks   :

6.) Start Repair :
    Finish Repair :
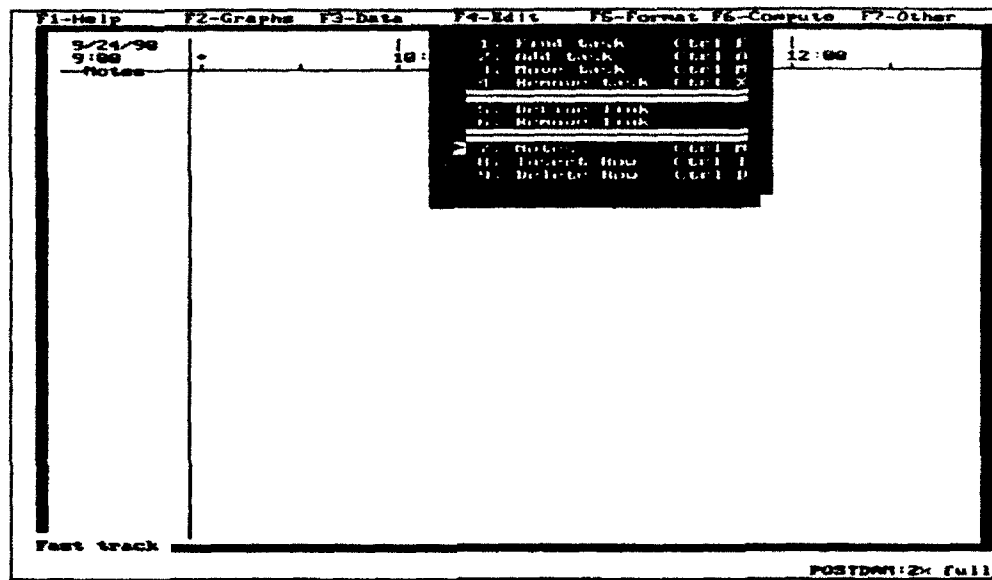

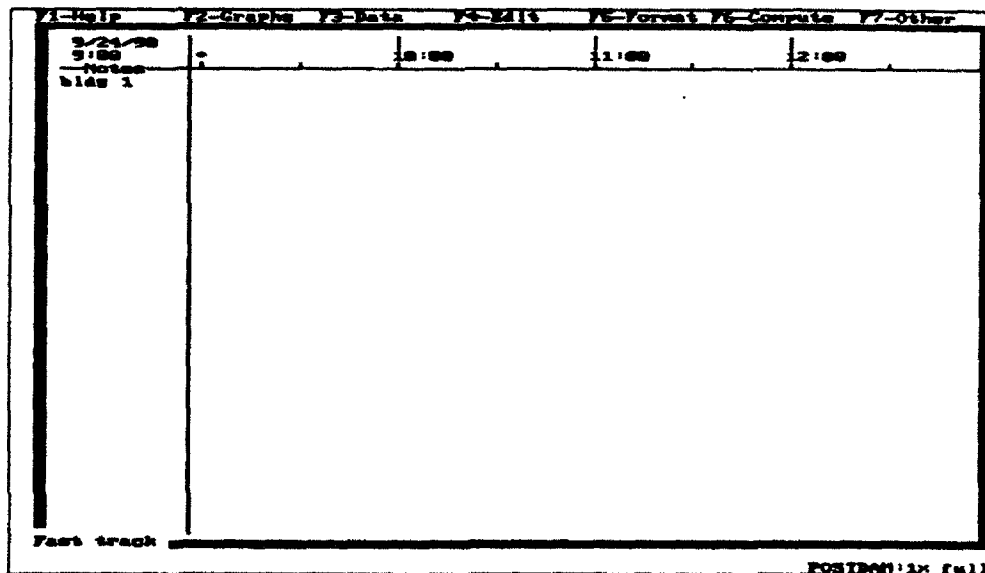Figure 3.21.   Repair Strategy File.

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Figure 3.22. Edit Menu.

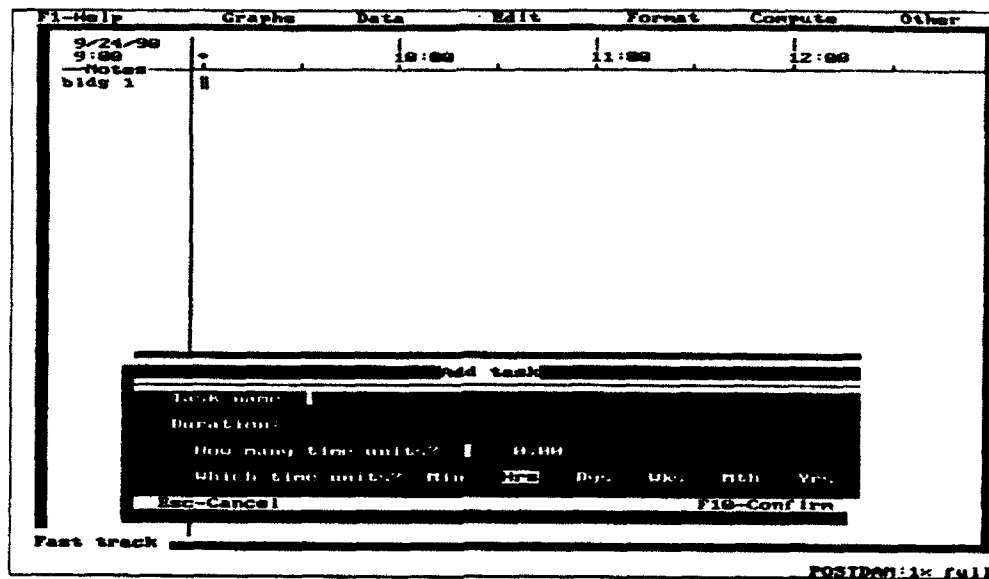Figure 3.23. Building 1 Added to the Notes Section.

20
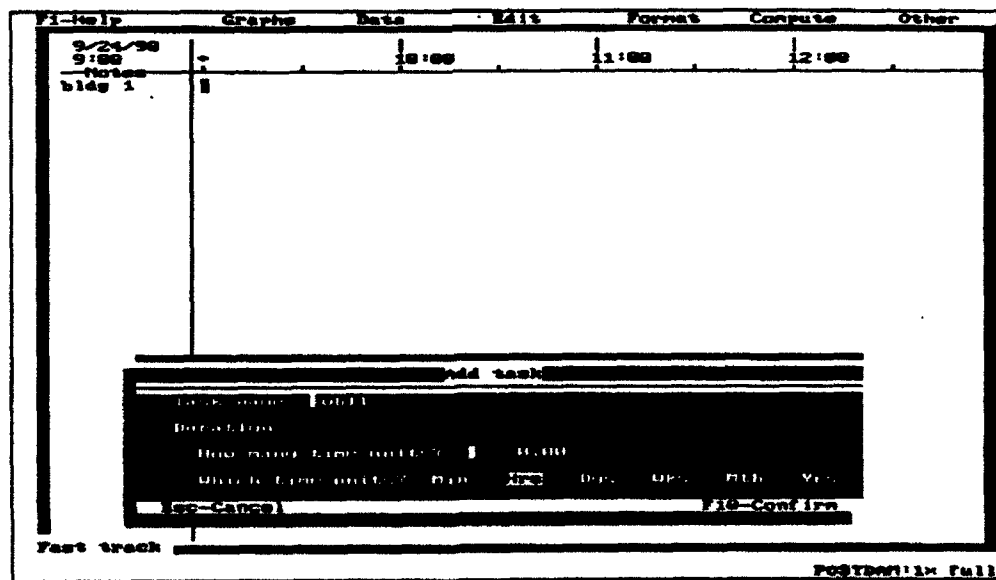
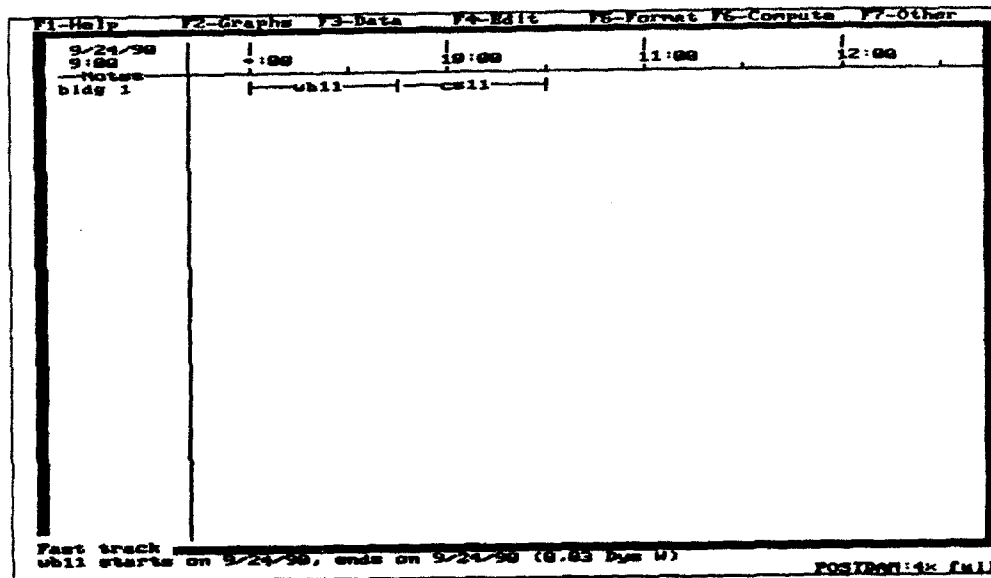Figure 3.24.   Add Task Window.

Figure 3.25.   Entering the Task wb11.

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Figure 3.26. Fast Track Form with the wbll Repair.

above process, but using the task name cs11, which stands for the first column splint repair in Building 1. The two repairs then appear in the Fast Track Form, as shown in Figure 3.27.

The duration of a repair is determined by the available equipment and labor. To do this, the user presses [F3], which displays the Data Menu shown in Figure 3.8. From the Data Menu, the user selects Option 4, "Work Breakdown Outline," which displays the work breakdown outline shown in Figure 3.28, with the cursor on wbll. Using the [Tab] key, the user moves the cursor to the planned duration column, and types res (abbreviation for resource) over the existing data, then uses the [Delete] key to remove the remaining data, as shown in Figure 3.29. The user then presses the [Enter] key to confirm the planned duration, then repeats the procedure for cs11, as shown in Figure 3.30. The user then returns to the Fast Track Form by pressing the [Esc] key twice.

Equipment and labor are now allocated to the repairs. By using the arrow keys, the user places the cursor at the small square in the Fast Track Form, so wbll is in the lower left corner, as shown in Figure 3.31. The user then presses the [F3] key, which displays the Data Menu shown in Figure 3.8. From the Data Menu, the user selects Option 3 "Allocations List," which displays the allocation list for repair wbll, as shown in Figure 3.32. Using the information from Figure 3.21, the user types sc machine (abbreviation for shotcrete machine) in the resource column, as shown in Figure 3.33. Next using the [Tab] key to move

Figure 3.27. Fast Track Form with the wbll and csll Repairs.
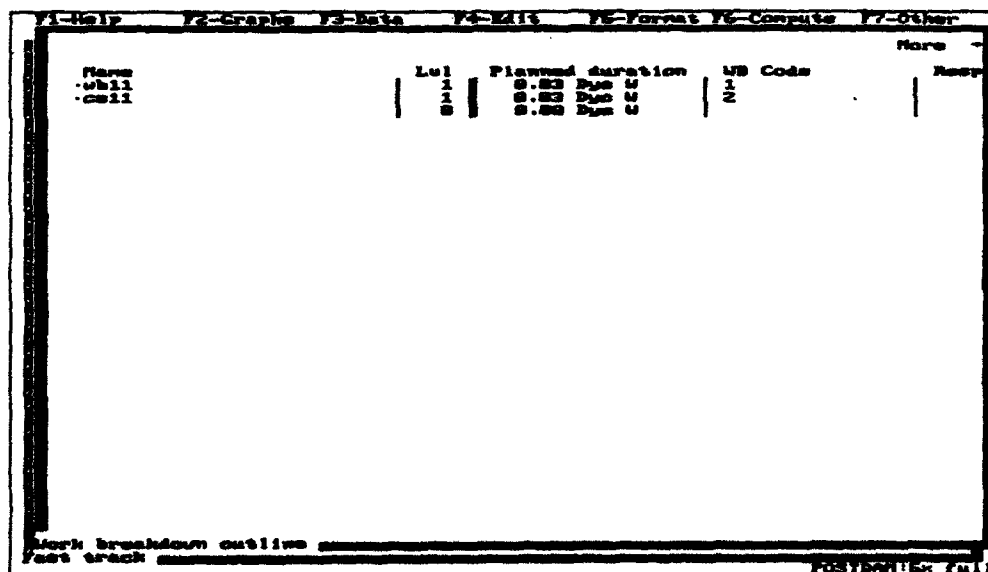
Figure 3.28. Work Breakdown Outline.

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Figure 3.29.   Changing the wb11 Planned Duration to res.

Figure 3.30.   Changing the Planned Duration for all Repairs to res.

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Figure 3.31. Fast Track Form with Cursor on wb11.

Figure 3.32. Allocation List for wb11.

Figure 3.33. Adding sc Machine to the wbll Allocations List.

between the columns, the user changes Work Units to Hrs, planned work to 1.75 (duration time is rounded off to the nearest quarter hour), and working hrs/day to 24.0, as shown in Figures 3.33 and 3.34. The user then presses [Enter], and is returned to a new row in the resource column, as shown in Figure 3.35. Figure 3.36 shows the completed allocation form for the repair wbll. When a resource item quantity is greater than 1, the repair duration time must be multiplied by the quantity to obtain the planned work value, has been doubled.

After all required equipment and labor resources have been entered in the wbll allocations list, the user presses [Esc], and is returned to the Fast Track Form, as shown in Figure 3.37. The user then positions the cursor at the right end of wbll, whereupon csll appears at the bottom left corner of the Fast Track Form, as shown in Figure 3.37. The above procedure is then repeated for wbll. The allocations list for csll is shown in Figure 3.38, and the Fast Track repair schedule for Building 1 is shown in Figure 3.39.

3.3.3.2   Adding Multiple Facilities

To add a new facility to the Fast Track Form, the user uses the arrow keys to move the cursor to the empty row just below where the last facility was added. The user then follows the same procedure used for Building 1 in Section 3.3.3.1 of this SUM. For example, the second facility, "Building 2," is added to the Fast Track Form, as shown in Figure 3.40, where wbl2 is a wall breach repair, and

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Resource	Planned work	Actual work	Remaining work	Working hrs/day	Overtime hrs/day	More → Planned cost
ac machine	1.75	0.00	0.00	24.00	0.00	0.00

wb11 allocations
Fast track

Needs Calc   POSTDOR:7% full

Figure 3.34.   Changing Working hrs/day to 24.0.

Resource	Quantity	Work units	Lag start	Planned work	Actual work	More Remaining work
ac machine	1.000	hrs	0.00	1.75	0.00	0.00
	1.000	Dys	0.00	0.00	0.00	0.00

wb11 allocations
Fast track

POSTDOR:7% full

Figure 3.35.   Starting a New Row in the wb11 Allocations List.

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Resource	Quantity	Work units	Lag start	Planned work	Actual work	More Remaining work
sc machine	1.000	Hrs	0.00	1.75	0.00	0.00
repair team	1.000	Hrs	0.00	1.75	0.00	0.00
ranset	2.000	Hrs	0.00	3.50	0.00	0.00
	1.000	Dys	0.00	0.00	0.00	0.00

wb11 allocations
Fast track
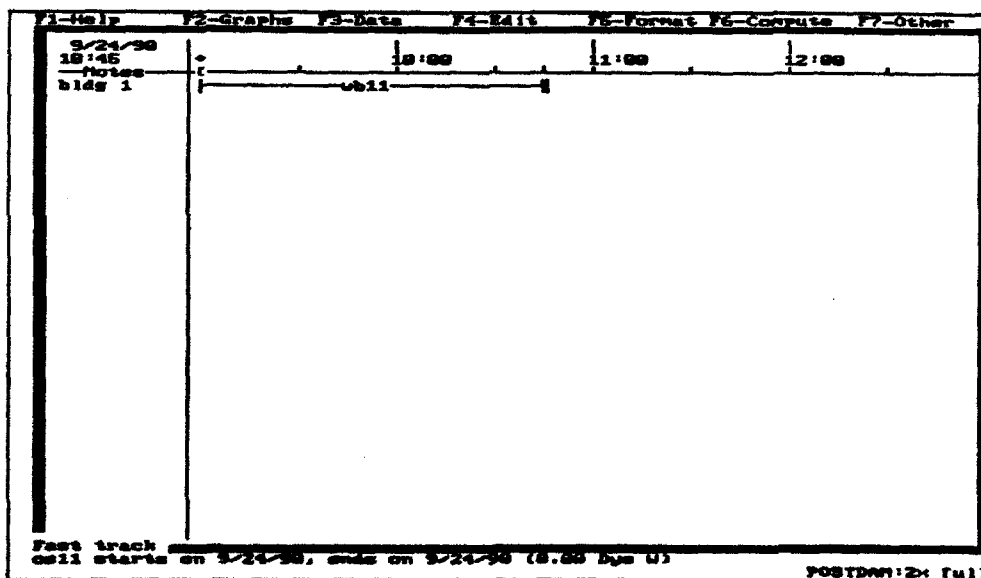POSTDAN:7% full

Figure 3.36.   Finished Allocations List for wb11.

Figure 3.37.   Fast Track Form with wb11 Scheduled.

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Resource	Quantity	Work units	Las start	Planned work	Actual work	More Remaining work
repair team	1.000	Hrs	0.00	0.50	0.00	0.00
	1.000	Dys	0.00	0.00	0.00	0.00

csll allocations
Fast track

Figure 3.38.   Allocations List for csll.

```
9/24/90
11:15          .            10:00         11:00         12:00
 Notes
 bldg 1        |-----------wb11----------|---csll---|
```

Fast track
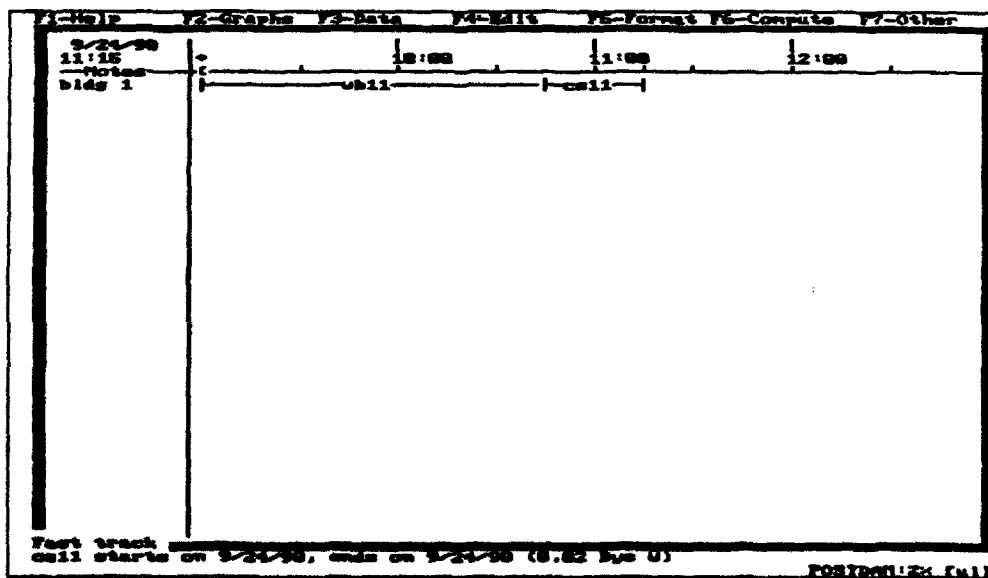csll starts on 9/24/90, ends on 9/24/90 (0.02 Dys 0)

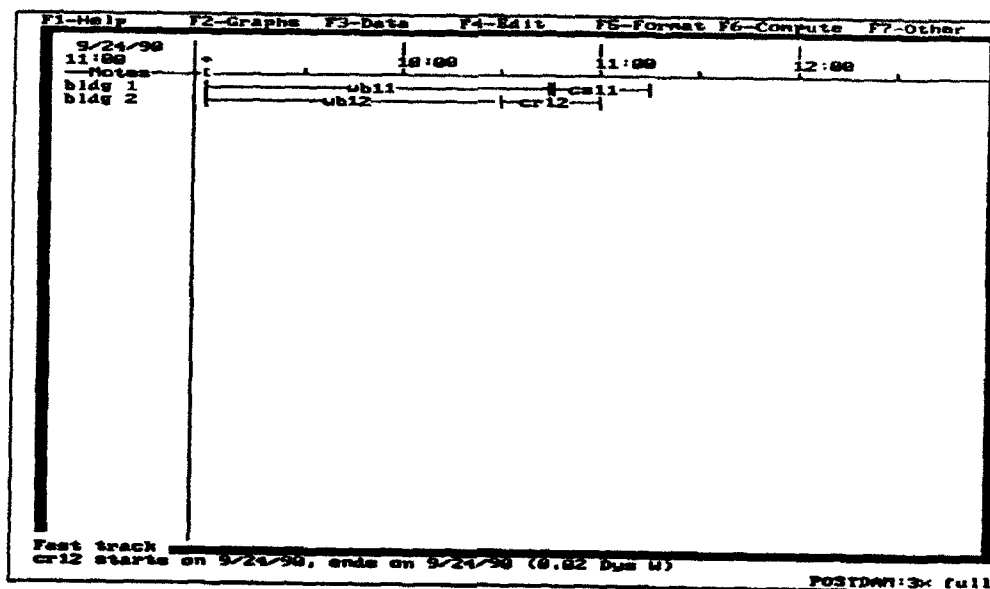Figure 3.39.   Schedule of Repairs for Building 1.

Figure 3.40. Schedule of Repairs for Buildings 1 and 2.

cr12 is a column replacement. Because there is no resource conflict, repairs to these two buildings can be done simultaneously, as shown on the Fast Track Form in Figure 3.40.

3.3.3.3   Resource Conflicts

The HPM system alerts the user if a resource conflict exists. As an example, the third facility, "Building 3" has been added to the Fast Track Form shown in Figure 3.41, where fr13 is a floor repair, and cs13 is a column splint repair. In Figure 3.41, HPM alerts the user of a resource conflict by writing the word Resource at the bottom of the Fast Track Form. The user can determine the exact nature of the resource conflict by viewing the allocations lists, as described in Section 3.3.3.1 of this SUM. Figures 3.42 and 3.43 show the allocations lists for fr13 and cs13, respectively, and the R on the left hand side of repair team indicates that the resource has been over allocated.

Resource conflicts are eliminated by delaying lower priority repairs. To reschedule a repair, the user places the cursor in the Fast Track Form on the repair to be rescheduled then selects the [F4] key to display the "Edit" Menu shown in Figure 3.22. From the Edit Menu, the user selects Option 3 "Move Task," which displays the "Moving Task" Window shown in Figure 3.44, with fr13 as the repair to be rescheduled. The user then reschedules the repair using the arrow keys, and confirms the action by pressing the [F10] key. Figure 3.45 shows the
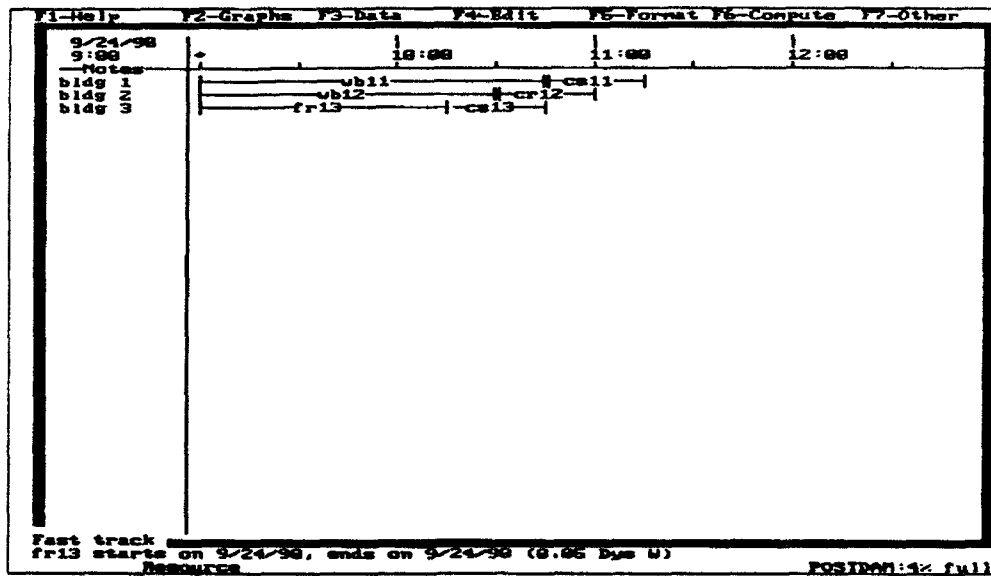
30
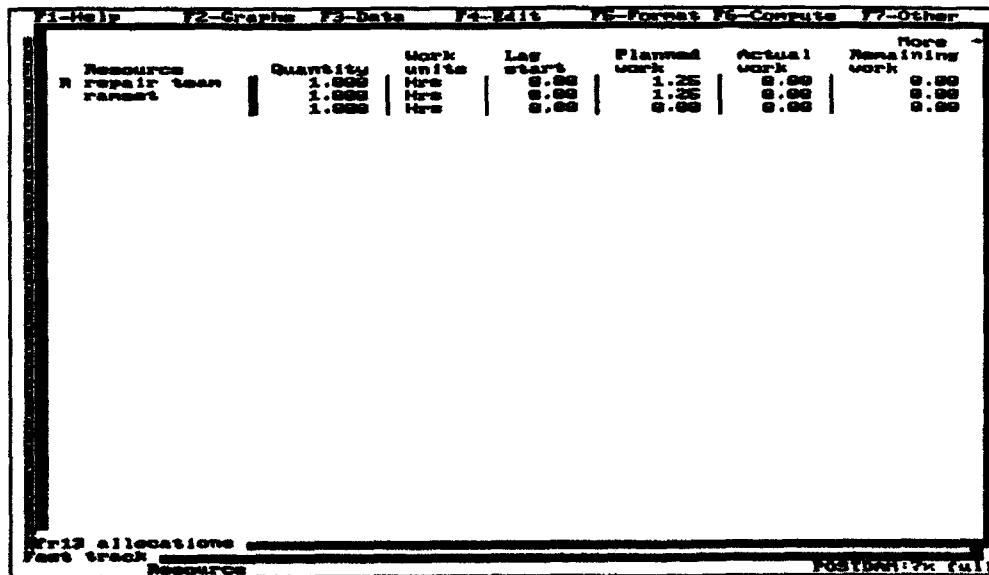
Figure 3.41. Schedule of Repairs with Resource Conflicts.

Figure 3.42. Allocations for fr13.

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```
                                                                    More
                              Work     Lag      Planned   Actual   Remaining
     Resource      Quantity   units    start     work      work     work
  R repair team  ‖   1.000 |  Hrs   |   0.00 |    0.50 |   0.00 |    0.00
                    1.000 |  Dys   |   0.00 |    0.00 |   0.00 |    0.00
```

cs13 allocations
Fast track
          Resource   POSTDAY:9x full

Figure 3.43.   Allocations for cs13.

```
F1-Help       Graphs      Data       Edit       Format     Compute      Other
   9/24/98
   9:00         |          |10:00      |11:00        |12:00
  --Notes--
  bldg 1        |————wb11————|——cs11——|
  bldg 2        |————wb12———|—cr|2—|
  bldg 3        |————fr13———|——cs13——|
```

```
                                          Moving Task:  fr13
                                          Use arrow keys to move
                                          task to new position.
                                          Esc-Cancel       F10-Confirm
```

Fast track
fr13 starts on 9/24/98, ends on 9/24/98 (0.86 Dys W)
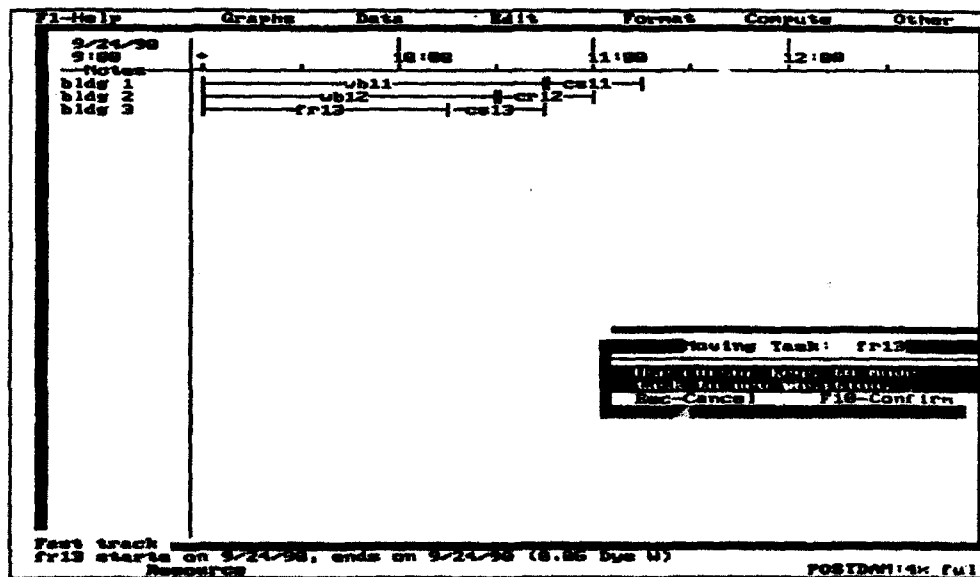   Resource   POSTDAY:4x full
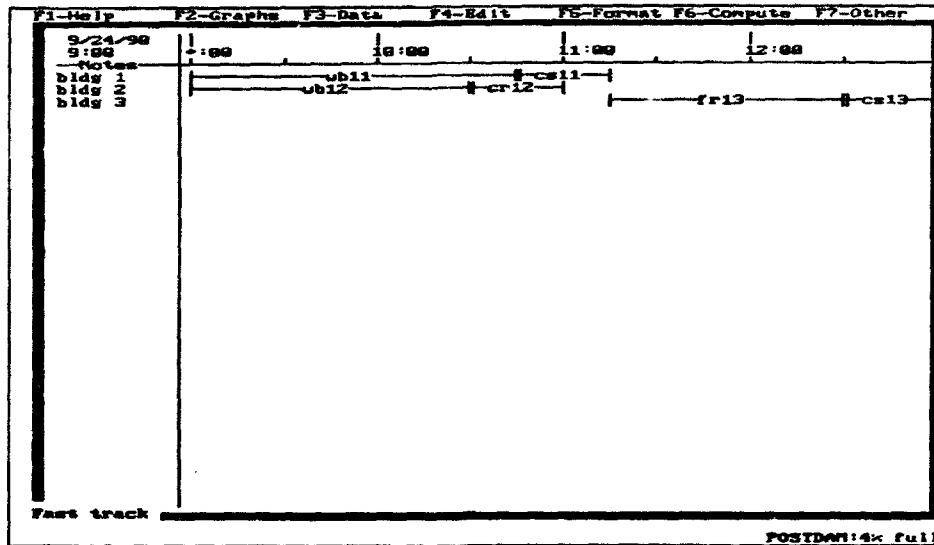
Figure 3.44.   Moving Task Window.

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Figure 3.45. Schedule of Repairs for Building 1, 2, and 3.

rescheduled repairs for Building 3. A 15-minute relocation period is always shown at the end of a facility repair period, to allow the repair team(s) time to move to the next damaged facility.

3.3.3.4 Deleting a Repair

To delete a repair from the Fast Track Form, the user places the cursor in the Fast Track Form on the repair to be deleted, then selects the [F4] key to display the "Edit" Menu shown in Figure 3.22. From the Edit Menu, the user selects Option 4, "Remove Task," which displays the "Remove Task" window shown in Figure 3.46, with cs13 as the repair to be deleted. The user then presses the [F10] key, and the repair is deleted.

3.3.4 Output

HPM produces 26 different reports, which provide a wide variety of information about the status of a project. The reports can be sent either to a disk file for permanent storage, or directly to a printer. For POST-DAM, only the Allocations by Task text report, Resources by Time Text Report, and Fast Track Graphics Report are of interest.

To access the reports section of HPM, the user selects Option 7, "Reports," in the main menu. This is accomplished by either pressing the [7] key, or using
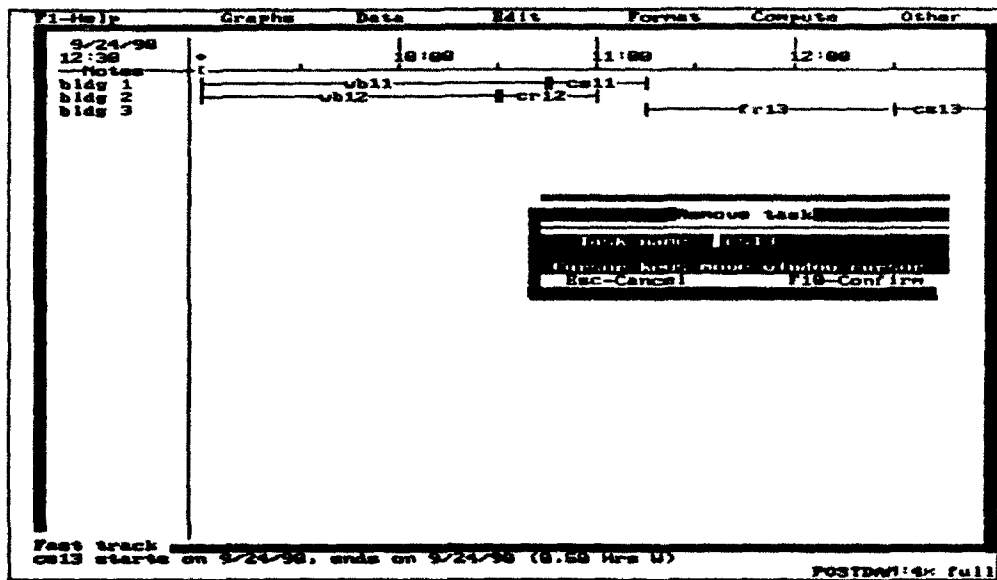
33

Figure 3.46. Remove Task Window.

the arrow keys to move the cursor to Option 7 and pressing [Enter]. The reports form then appears on the screen, as shown in Figure 3.47.

3.3.4.1 Allocations by Task Text Report

To output the Allocations by Task Text Report, the user places the cursor on "Allocations by Task" in the reports form, using the arrow keys, then presses the [F2] key, to display the Print Options Menu shown in Figure 3.48. The user then selects Option 1, "Run Report," and the Text Report Option Window appears on the screen, as shown in Figure 3.49. If a hard copy of the report is required, the user presses the [F10] key and the report is sent to the printer. If the report needs to be stored in a file, the user types in a filename (e.g., pdat1) at the "Filename" prompt, and changes the "Print To" option to "Disk File," as shown in Figure 3.50. An example of the Allocations by Task Output is shown in Figure 3.51.

3.3.4.2 Resources by Time

To output the Resources by Time Text Report, the user places the cursor on "Resources by Time" in the reports form using the arrow keys, then presses the [F2] key to display the Print Options Menu shown in Figure 3.48. The user then selects Option 1, "Run Report," and the Text Report Option Window appears on the

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Figure 3.47.   Reports Form.

Figure 3.48.   Print Options Menu.

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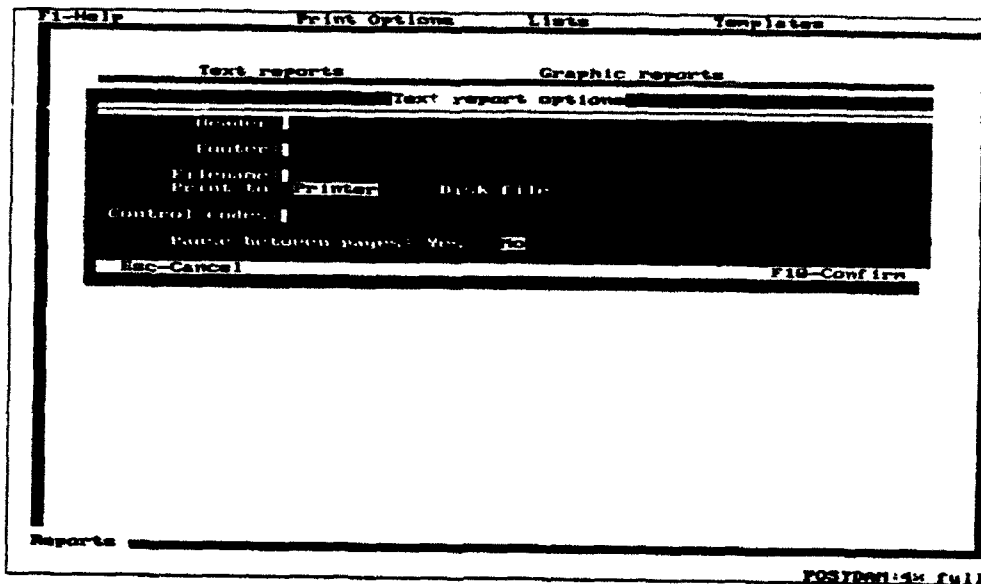
Figure 3.49. Text Report Option Window.
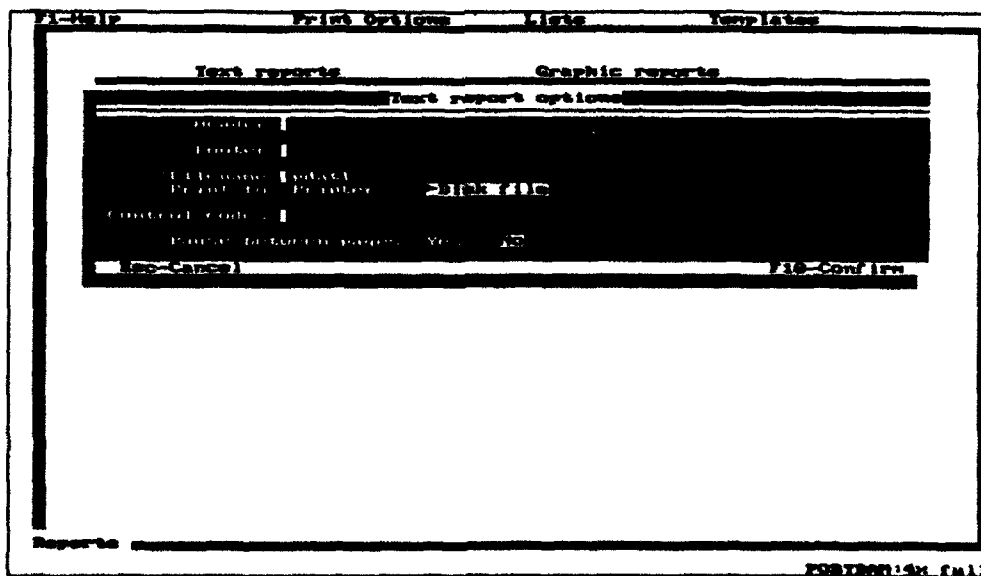
Figure 3.50. Disk File pdat1.

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Task name	Resource name	Resource quantity	Planned work
cr12	ramset	1.000	0.50 Hrs W
cr12	shoring jack	1.000	0.50 Hrs W
cr12	repair team	1.000	0.50 Hrs W
cs11	repair team	1.000	0.50 Hrs W
cs13	repair team	1.000	0.50 Hrs W
fr13	repair team	1.000	1.25 Hrs W
fr13	ramset	1.000	1.25 Hrs W
wb11	repair team	1.000	1.75 Hrs W
wb11	sc machine	1.000	1.75 Hrs W
wb11	ramset	1.000	1.75 Hrs W
wb12	repair team	1.000	1.50 Hrs W
wb12	ramset	2.000	3.00 Hrs W
wb12	sc machine	1.000	1.50 Hrs W

Figure 3.51. Allocations by Task Output.

screen, as shown in Figure 3.49. If a hard copy of the report is required, the user presses the [F10] key and the report is sent to the printer. If the report needs to be stored in a file, the user types in a filename (e.g., pdrtl) at the "Filename" prompt, and changes the "Print to" option to "Disk File," as shown in Figure 3.52. An example of the Resources by Time output is shown in Figure 3.53 for 9:00 and 9:15.

3.3.4.3   Fast Track Chart Graphics Report

To output the Fast Track Chart Graphics Report, the user places the cursor on "Fast Track Chart" in the reports form using the arrow keys, then presses the [F2] key to display the Print Options Menu shown in Figure 3.48. The user then selects Option 1, "Run Report," and the Graphics Report Options Window appears on the screen, as shown in Figure 3.54. If a hard copy of the report is required, the user presses the [F10] key and the report is sent to the printer. If the report needs to be stored in a file, the user types in a filename (e.g., pdftl) at the "Filename" prompt, and changes the "Print to" option to "Print file," as shown in Figure 3.55. An example of the Fast Track Chart output is shown in Figure 3.56.
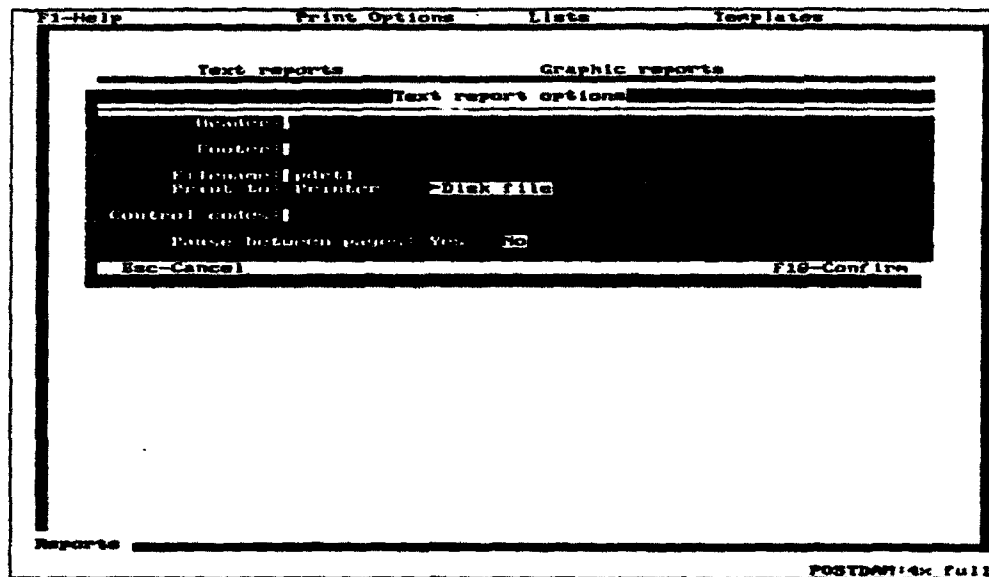
Figure 3.52. Disk File pdrt1.

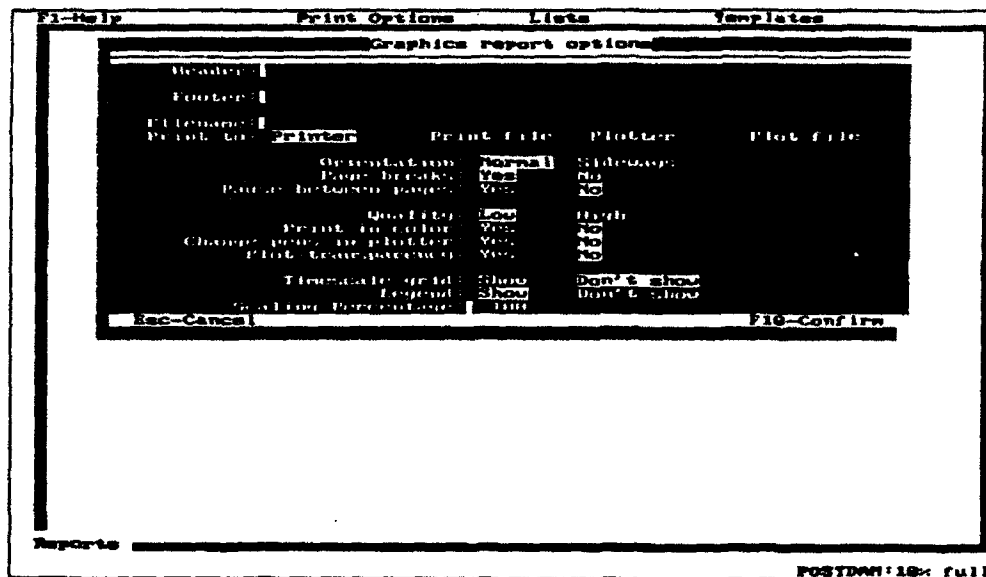| Resources by Time	31-Oct-1990		Page 1-1
	24-Sep-1990 9:00	24-Sep-1990 9:15	
bulldozer Resource loading	0.00	0.00	
ramset Resource loading	3.00	3.00	
repair team Resource loading	2.00	2.00	
sc machine Resource loading	2.00	2.00	
shoring jack Resource loading	0.00	0.00	

Figure 3.53.   Resources by Time Output.
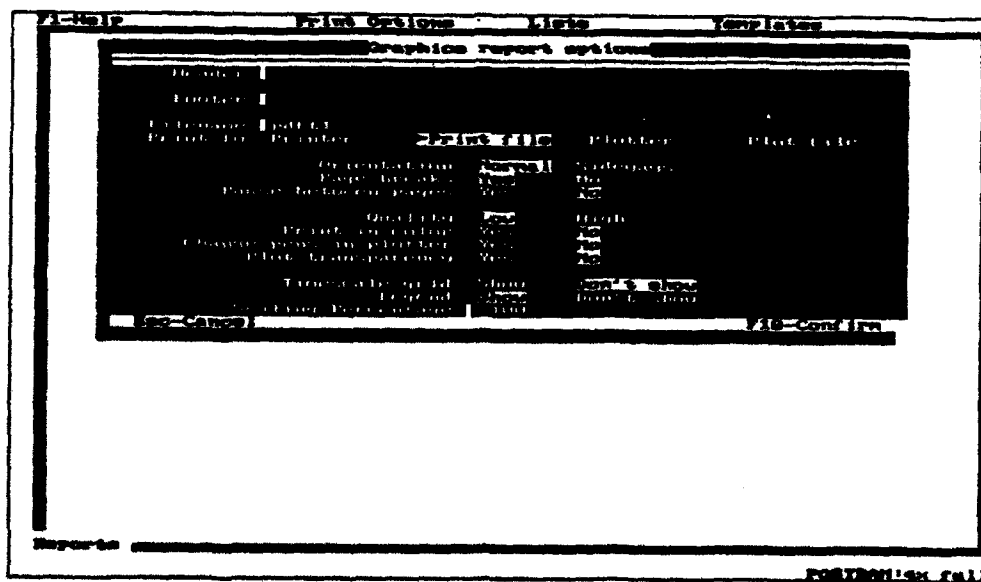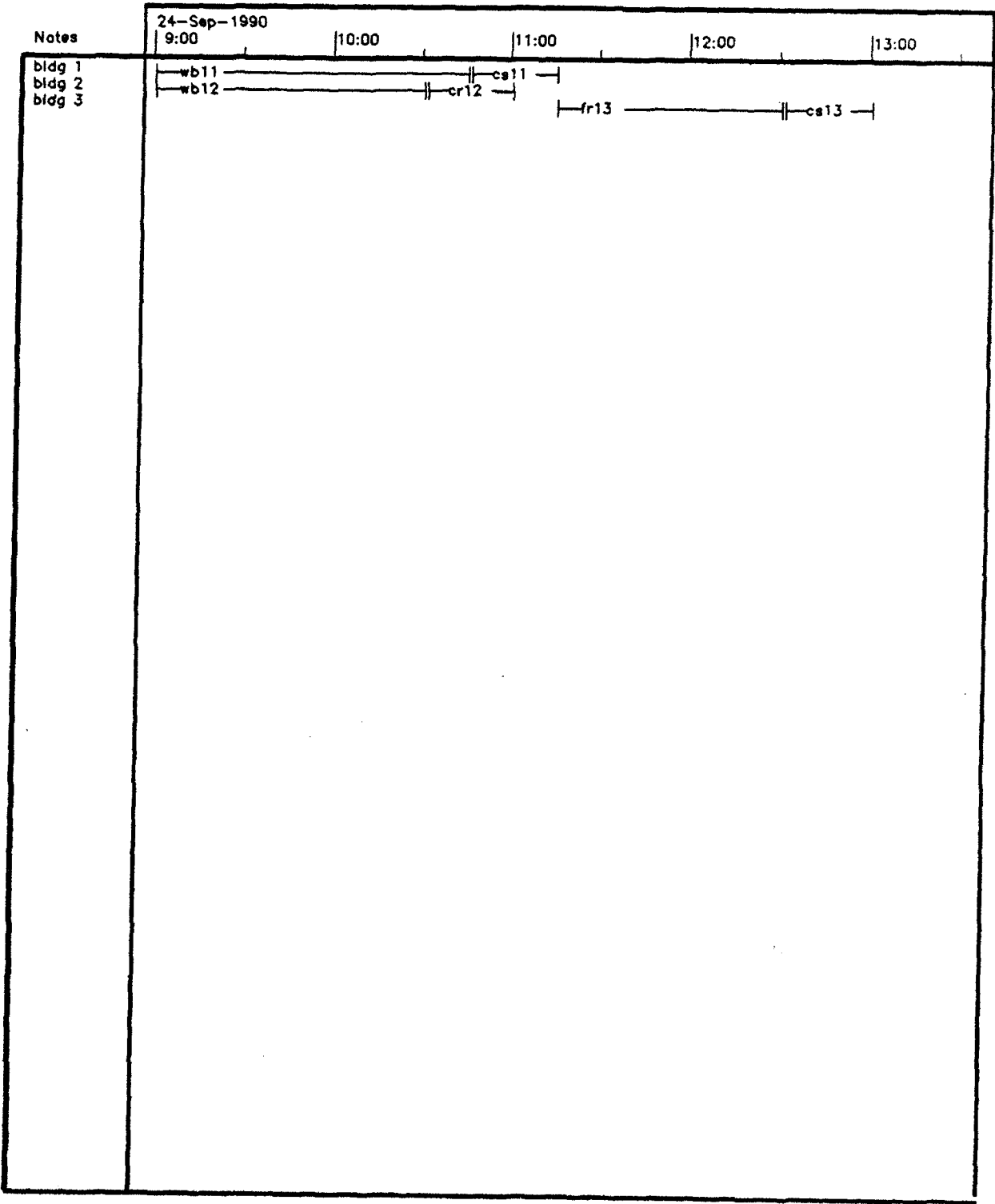
Figure 3.54. Graphics Report Options Window.

Figure 3.55. Print File pdftl.

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Figure 3.56. Fast Track Chart Output.